Translation

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

| Applicant's or agent's file reference | FOR FURTHER ACTION | See Form PCT/IPEA/416 |
|---|---|---|
| LO_006 PCT | | |
| International application No. | International filing date *(day/month/year)* | Priority date *(day/month/year)* |
| PCT/EP2004/003796 | 08.04.2004 | 11.04.2003 |
| International Patent Classification (IPC) or national classification and IPC | | |
| Applicant | | |
| LEYBOLD OPTICS GMBH | | |

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 8 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 1-4 sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))

      _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

| | | |
|---|---|---|
| ☒ | Box No. I | Basis of the report |
| ☐ | Box No. II | Priority |
| ☐ | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| ☐ | Box No. IV | Lack of unity of invention |
| ☒ | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| ☐ | Box No. VI | Certain documents cited |
| ☒ | Box No. VII | Certain defects in the international application |
| ☒ | Box No. VIII | Certain observations on the international application |

| Date of submission of the demand | Date of completion of this report |
|---|---|
| Name and mailing address of the IPEA/EP | Authorized officer |
| Facsimile No. | Telephone No. |

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/003796

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

☐ international search (Rule 12.3 and 23.1(b))

☐ publication of the international application (Rule 12.4)

☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-12 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

nos. _____ as originally filed/furnished

nos.* _____ as amended (together with any statement) under Article 19

nos.* 1-25 received by this Authority on 10.02.2005 with letter of 10.02.2005

nos.* _____ received by this Authority on _____

☒ the drawings:

sheets 1/6-6/6 as originally filed/furnished

sheets* _____ received by this Authority on _____

sheets* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

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**Box No. V** **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | | |
|---|---|---|---|
| Novelty (N) | Claims | | YES |
| | Claims | 1, 18 | NO |
| Inventive step (IS) | Claims | | YES |
| | Claims | 1-25 | NO |
| Industrial applicability (IA) | Claims | 1-25 | YES |
| | Claims | | NO |

2. Citations and explanations (Rule 70.7)

1. This report makes reference to the following documents:

D1: EP-B-0 349 556 (OECHSNER HANS) 18 November 1993 (1993-11-18)

D2: PATENT ABSTRACTS OF JAPAN, Vol. 2000, No. 25, 12 April 2001 (2001-04-12) & JP 2001 210245 A (SHINCRON:KK), 3 August 2001 (2001-08-03)

D3: PATENT ABSTRACTS OF JAPAN, Vol. 0142, No. 39 (E-0930), 21 May 1990 (1990-05-21) & JP 2065230 A (MITSUBISHI ELECTRIC CORP), 5 March 1990 (1990-03-05)

2. PCT Article 33(2), Novelty

2.1 The subject matter of claims 1 and 18 lacks novelty within the meaning of PCT Article 33(2).

2.2 D1 discloses (the reference signs in parentheses refer to D1): a high-frequency plasma beam source (figure 2; column 8, lines 33-39) having a plasma vessel (6) for a plasma (7), electrical means for igniting and maintaining the plasma (4),

an extraction grid (1) on a high-frequency potential (column 8, lines 39-42) for extracting a plasma beam (8) from the plasma vessel, and a discharge opening, the extraction grid being arranged near the discharge opening (figure 2).

Each beam has a specific divergence (see point 3.2), and therefore the subject matter of claim 1 lacks novelty.

2.3 The subject matter of claim 18 lacks novelty for the same reason as that indicated in point 3.2.

3. Dependent claims 2-10, 11-17 and 19-25

3.1 Claims 2-10, 11-17 and 19-25 contain no features that, in combination with the features of any claim to which they refer, meet the PCT requirements for novelty and inventive step. Several of the claims are so unclear that no difference with respect to the prior art can be established (see also point 2 above).

3.2 The applicant should note, in particular, that the subject matter of claim 4 does not involve an inventive step. The subject matter of claim 4 differs from that known from D1 only in that the extraction grid is concave when viewed from the plasma vessel.

Therefore, the problem to be solved by the present invention can be regarded as that of increasing the

beam angle in order to treat a broader surface.

D2 discloses a high frequency ion beam source (abstract, figure 1) having a plasma vessel (1) for a plasma and an extraction grid (7,8) for extracting an ion beam from the plasma vessel, the extraction grid being concave when viewed from the plasma vessel (figure 1). D2 teaches that the extraction grid is designed to produce a divergent beam and to obtain a greater beam angle (fourth paragraph). A person skilled in the art seeking a document for solving the above-mentioned problem would find D2 and integrate the extraction grid from D2 into the high-frequency plasma beam source in D1, without thereby being inventive.

3.3 Furthermore, D1 discloses a concave extraction grid (7) that is also heterogeneous, the radiation of a surface that has a cap (36), a magnet (5), and a vacuum chamber having a housing (35). The extraction grid in D2 has openings that are not equidistant. D1 shows an extraction grid with a mesh width that is less than the thickness of the vessel loading zone between the extraction grid and the plasma (column 4, lines 21-24). In D1, radiation is used to coat and modify a surface (column 1, lines 3-7).

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**Box No. VII Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

1. D2 has not been indicated in the description (PCT Rule 6.2(b)).

**Box No. VIII** **Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. PCT Article 6, clarity:

1.1 The application does not meet the requirements of PCT Article 6 because the subject matter of claims 1, 2, 3, 4 and 22 lacks clarity.

1.2 Claim 1 defines a high-frequency plasma beam source, the purpose of which is to generate a divergent plasma beam, but said claim does not indicate the necessary technical features. The wording of claim 1 does not make it clear what technical features lead to the beam divergence (PCT Guidelines, 5.35).

1.3 The term "essentially" in claim 1 is unclear and cannot be used clearly to delimit the subject matter of claim 1 over the prior art (PCT Guidelines, 5.38). The applicant should note that each beam has a specific divergence.

1.4 The phrase "through targeted interaction" in claim 2 lacks clarity. It cannot be determined with respect to the high-frequency plasma beam source whether the divergence is caused by "targeted" or "non-targeted" interaction between the plasma and the extraction grid.

1.5 The wording of claim 3 is unclear. It appears that what is meant by "surface" is the surface to be radiated. It is not possible to determine from a

**Box No. VIII** **Certain observations on the international application**

plasma beam source that is not in operation whether the plasma beam is adapted to the shape of a portion of the above-mentioned surface. The same applies, *mutatis mutandis*, to claim 22.